

### **REMARKS**

The applicant respectfully request reconsideration in view of the amendment and the following remarks. Support for amended claim 1 can be found in claim 1. The applicant has deleted "fluorene units" as the second repeat unit. Support for newly added claims 28-31 can be found in claim 1. **The applicant authorizes the USPTO to charge \$208.00 for the additional four claims added.** No new matter has been added.

Claims 1-5, 7, 9-10, 13-18, 20, 24, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable by WO 03/035714 (Towns). Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towns in view of US 6,858,703(Allen). Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Towns in view of Allen and further in view of US 6,740,900 (Hirai). Claims 1-5, 7, 9-10, 13, 17, 19, 20 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,948,552 (Antoniadis) in view of *Advanced Materials*, 1999, Vol. 11, No. 3, pages 241-246 (Bradley). Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antoniadis in view of Allen. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Antoniadis in view of Allen and further in view of Hirai. The applicant respectfully traverses these rejections.

### **Comments to the Interview**

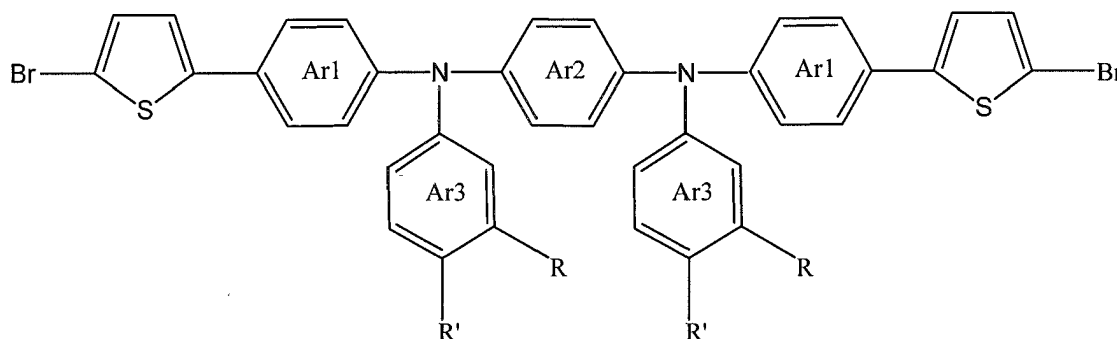
The applicant conducted an interview with the Examiner on December 22, 2010 and discussed eliminating as the second repeat unit fluorene from independent claim 1. The Examiner indicated that this would overcome the rejections of record. However, the Examiner stated that he found additional prior art that he believed taught phenyl, and heteroaryl. The Examiner indicated that he thought that the spirofluorene, indofluorene and dihydrophenanthrene would be allowable over this art. The Examiner indicated that he would indicate what the new

prior art is on the interview summary. The applicant added claims 28-31 that should be allowable in view of the new prior art. Since the applicant is not aware of the prior art, the applicant does not believe that it is necessary to amend the claims to distinguish over the new prior art.

### **Rejections Over Towns**

Claims 1-5, 7, 9-10, 13-18, 20, 24, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable by Towns. Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towns in view of Allen. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Towns in view of Allen and further in view of Hirai.

As the Examiner stated at page 3 of the Office Action, Towns discloses the following formula



With respect to this formula, the following must be stated:

There are two significant differences between this formula and formula (I) of pending claim 1 of the present application. First of all, the formula of Towns contains two thiophene rings (five membered ring containing S) which are not part of the repeating unit (1) of claim 1 of the present application. Furthermore, as can be seen from the above- depicted formula, only the phenyl rings which are not part of the polymer main chain (i.e. Ar<sup>3</sup>) are substituted whereas the phenyl rings of the polymer main chain (i.e. Ar<sup>1</sup> and Ar<sup>2</sup>) are unsubstituted. As the Examiner has

correctly stated Town's Ar<sup>1</sup> would correspond to the applicant's claimed Ar<sup>1</sup> and Town's Ar<sup>2</sup> would correspond to the applicant's claimed Ar<sup>2</sup> and Town's Ar<sup>3</sup> would correspond to the applicant's Ar<sup>3</sup>.

Towns generically discloses that In contrast to the disclosure of Towns, formula (I) of claim 1 of the present application is characterized in that **"at least one of Ar<sup>2</sup>, and/or either or both of Ar<sup>1</sup> is substituted with at least one substituent"** (see the **bottom of claim 1**). Consequently, the repeating unit of formula (I) of claim 1 of the present application differs substantially from the disclosure of the prior art in that at least one of the phenyl rings of the polymer main chain is substituted. Such a disclosure cannot be found in Towns.

Therefore, pending claim 1 is not rendered obvious over Towns.

For the reasons stated above especially since Towns does not disclose that at least one of Ar<sup>2</sup>, and/or either or both of Ar<sup>1</sup> is substituted with at least one substituent. Therefore, Towns teaches away from the applicant's claimed invention and would not rendered the applicant's claimed invention obvious.

With respect to independent claim 24, claim 24 requires wherein the substituent on Ar<sup>1</sup> or Ar<sup>2</sup> is selected from the group consisting of optionally substituted, aliphatic or alicyclic C<sub>1-20</sub> fluoroalkyl; halogen; nitro; cyano; sulfone and sulfoxide. These substituents are not disclosed as being the substituent on the Ar<sup>1</sup> or Ar<sup>2</sup>.

Additionally, Towns discloses fluorene as the second repeat unit. The applicant has amended independent claim 1 and claim 1 requires that the second repeat unit is selected from optionally substituted phenyl, spirobifluorene, indenofluorene, heteroaryl or dihydrophenanthrene.

The applicant believes that the secondary references would not render the applicant's claimed invention obvious.

A statement that modifications of the prior art to meet the claimed invention would have been "obvious to one of ordinary skill in the art at the time the invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See MPEP § 2143.01 IV. "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1396 (2007) quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). Furthermore, the Examiner cannot selectively pick and choose from the disclosed parameters without proper motivation as to a particular selection. The mere fact that a reference may be modified to reflect features of the claimed invention does not make the modification, and hence the claimed invention, obvious unless the prior art suggested the desirability of such modification. *In re Mills*, 916 F.2d 680, 682, 16 USPQ2d 1430 (Fed. Cir. 1990); *In re Fritch*, 23 USPQ2d 1780 (Fed. Cir. 1992). Thus, it is impermissible to simply engage in a hindsight reconstruction of the claimed invention where the reference itself provides no teaching as to why the applicant's combination would have been obvious. *In re Gorman*, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991).

According to the device examples of the present application two inventive copolymers and two comparative polymers have been tested in electroluminescent devices. The inventive copolymers differ from the copolymers of the prior art only in that the triarylamine unit of

formula (I) (i.e. monomer 2) is substituted not only at "Ar<sup>3</sup>" but also at "Ar<sup>2</sup>" whereas the corresponding comparative unit is only substituted at "Ar<sup>3</sup>".

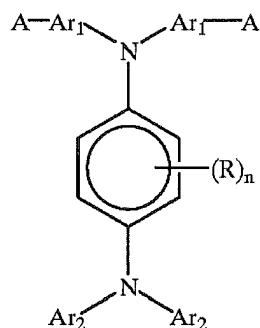
As is shown in the data of the working examples and already stated in the specification of the present application, polymers containing substituted repeating units according to the present invention are blue-shifted relative to polymers containing the unsubstituted prior art repeating unit. The respective CIE y-coordinate serves as a particularly useful guide to the depth of color of a polymer. Alkyl substituted polymers are blue-shifted relative to corresponding comparative polymers. A very marked blue shift is observed in fluorine substituted polymers (see page 25 of the applicant's specification). For the above reasons, these rejections should be withdrawn.

### **Rejections Over Antoniadis**

Claims 1-5, 7, 9-10, 13-20 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antoniadis in view of Bradley. Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antoniadis in view of Allen. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Antoniadis in view of Allen and further in view of Hirai.

Antoniadis discloses polymers containing units of formulae (II) and (III), but do not disclose other copolymers.

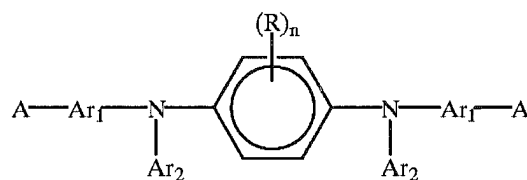
Formula (II)



35

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Formula (III)



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(see col. 9, lines 28-

50).

The applicant has three independent claims (claims 1, 13 and 24).

### **Independent Claims 1 and 13**

The applicant's pending claims 1 and 13 require that the second repeat unit is selected from optionally substituted phenyl, spirobifluorene, indenofluorene, heteroaryl or dihydrophenanthrene. As the Examiner has correctly stated in item no. 15 at the top of page 10 of the Office Action, Antoniadis discloses a triarylamine but does not disclose nor teach the applicant's claimed second repeat unit being selected from optionally substituted phenyl, fluorene, spirobifluorene, indenofluorene, heteroaryl or dihydrophenanthrene. It is noted that amended claims 1 and 13 now require that the second repeat unit is selected from optionally substituted phenyl, spirobifluorene, indenofluorene, heteroaryl or dihydrophenanthrene. The applicant does not require that the second repeat unit is a fluorene unit. Antoniadis teaches away from the applicant's claimed invention.

Bradley discloses a copolymer having beside the triarylamine units also fluorene units (see page 11). Again, the applicant has amended independent claims 1 and 13 so that these claims require that the second repeat unit is selected from optionally substituted phenyl, spirobifluorene, indenofluorene, heteroaryl or dihydrophenanthrene. The applicant does not believe that Bradley teaches the second repeat unit.

The polymers of the present application which contain repeat units of formula (I) with at least one substituent as well as the claimed co-units, are significantly bluer than the unsubstituted units as disclosed in the prior art (specification, page 3, paragraph below the summary of the invention). The blue emission of the copolymers, described by the CIE-color coordinates, is also clearly described in the working examples of the present application (see especially page 25 of the specification). These results are unexpected!

#### **Claim 24**

It is noted that Antoniadis does not disclose that the substituent on Ar<sup>1</sup> or Ar<sup>2</sup> is selected from the group consisting of optionally substituted, aliphatic or alicyclic C<sub>1-20</sub> fluoroalkyl; halogen; nitro; cyano; sulfone and sulfoxide as is required by the applicant's independent claim 24. Therefore, Antoniadis teaches away from the applicant's claimed invention.

The secondary references do not cure the deficiency of the Antoniadis. For the above reasons, these rejections should be withdrawn.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

A one month extension fee has been paid. **The applicant authorizes the USPTO to charge \$208.00 for the additional four claims added.** Applicant believes that no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 03-2775, under Order No. 14113-00040-US from which the undersigned is authorized to draw.

Date: December 30, 2010

Respectfully submitted,

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